

The Growth Monitoring of Young Children in the Kep District of Cambodia.

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**Maral Nadjafi
University of Toronto, Faculty Medicine
Centre for International Health**

Outline

1. Background
 - 1.1. Cambodia
 - 1.2. Growth Monitoring
 - 1.3. Growth Monitoring in Cambodia
 - 1.4. Growth Monitoring in Kep
 - 1.5. Research Question
 2. Methodology and Data Analysis
 - 2.1. Participation and Recruitment
 - 2.2. Data Collection
 - 2.3. Data Analysis
 3. Results and Interpretations
 - 3.1. Demographics
 - 3.2. Knowledge about Growth Monitoring
 - 3.3. Growth Monitoring
 - 3.4. Nutritional Status
 4. Study Limitations
 5. Conclusions
 6. Acknowledgements
- References

1. Background

1.1 Cambodia

After years of tumultuous civil war and genocide, Cambodia has emerged as a relatively stable and peaceful country in the past decade, gradually reconstructing its infrastructure. Years of destruction, however, have decimated the country's health care system and the rebuilding process has been very slow. Local government's efforts continue to be inadequate and Cambodia's health indices remain among the lowest in Asia. Given that Cambodia is a young country with "more than half of its population under the age of 18" (15), the poor health care delivery is noticeably apparent in the paediatric population. According to a report by UNICEF (15), compiled in 2004, Cambodia has a high infant (under age 1) mortality of 97, and a staggering Child mortality (under age 5) of 141 out of 1000. The same UNICEF report states that "nearly half of all Cambodian children are malnourished" (15). Hence, it is not farfetched that nutrition appears to be a major factor contributing to the high child mortality in Cambodia, with 54% of all causes mortality associated with malnutrition (8).

1.2 Growth Monitoring

Growth of a child is one of the best indicators of the child's nutritional status and health in general. Hence, measuring a child's growth on a regular basis allows for early detection of nutritional and health problems (2). Recent studies have shown that monitoring children's growth, especially by their primary caregivers, is an effective way of reducing child malnutrition (6). Decline in the rate of growth of young child has been shown to be associated with increased risk of subsequent mortality (7). Thus, diligent growth monitoring is a relatively inexpensive way to strengthen prevention health programs, especially in the developing countries, by identifying children at risk at a time when remedial action is easier.

In the developed countries, growth monitoring includes measuring children's weight, height and head circumference. Weight measurements, however, are often the only index measured in the developed countries. Hence, growth monitoring is defined by Panapanich and Garner as "the

regular recording of a child's weight coupled with some specified remedial action if the weight is abnormal in some way", in a Cochrane review on the topic (3). In resource-limited countries, measuring children's weight is more feasible compared to the other indices. First, weight is a useful indicator for growth monitoring. Secondly, weight is more sensitive to a child's nutritional status compared to height or head circumference. Thirdly, the only needed tools are weighing scales and charts which are both easy to carry and relatively inexpensive.

Looking at the current weight of a child is less informative compared to following a child over time and assessing the rate of growth. Ideally, children should be weight monthly from birth to five years of age. As indicated by a United Nation's document on Use of Anthropomorphic Indices in Children the "use of growth monitoring extends beyond problem detections"(11). It encourages the idea of "well baby" visits and increases the number of occasion where a health care professional can assess a child. Furthermore, it provides an opportunity for educations of mothers by the health care professionals about child's health, nutrition, and causes of poor growth. This in turn leads to action "at the level of the household and of the community itself" (11). Success stories of such community involvement following growth monitoring programs have been reported in Colombia, Thailand and Tanzania (11).

1.3 Growth Monitoring in Cambodia

The National Nutrition Program, one of the programs of the Ministry of Health (MOH) of Cambodia aimed at combating child malnutrition, has included "monitoring and surveillance of nutritional status" as one of its programs (12). The document explains that "the nutritional status of children aged 0-5 must be monitored through child health cards (yellow cards) which include a growth charts" (12). The aforementioned "child health cards" are cards issued to each child to record information on a child's growth, immunizations and vitamin A administration. The most recent child health card, including the growth charts, was updated by the ministry of Health in 2001 (12).

An overview of the Nutritional Sector Activities in Cambodia, published by Helen Keller International Cambodia in 2002, indicated that growth monitoring in Cambodia is conducted

“only by international organizations” and “no local NGO’s were found to include this activity as part of their nutrition program” (9). The report also indicates that although WFP and UNICEF with the MOH are conducting growth monitoring, MOH has not implemented growth monitoring in many areas of the country.

Following that report in 2002, the Ministry of Health set out to improve growth monitoring in Cambodia. Growth Monitoring (GM) and Growth Promotion (GP) were added to the nutrition module of the “Minimum Package of Activities” (MPA) Module 10 for health centre staff (Annual review 2006). The goal of MPA 10 regarding growth monitoring and growth promotion was to “enable Health Centre staff to detect malnutrition at an early stage, so that appropriate actions can be taken”. In 2004 ministry of Health “started to implement growth monitoring and growth promotion activities” as part of the MPA 10. The training and implementation were first conducted in 2004 in three target provinces of Kampot, Kep and Kampong Speu as a pilot project to be expanded to the other provinces.

After a review of the first three target provinces in 2005, it was determined that the health staff faces some constraints that interfered with growth monitoring and growth promotion activities. Conducting growth monitoring during community outreach was particularly ineffective because of “time constraints, low attendance and lack of experience by the outreach staff”. As a result, it was recommended that growth monitoring be conducted only “at fixed services such as health centers and referral hospitals”. The health centres were then required to “submit growth monitoring report, using growth monitoring form” to the Ministry of Health. Since 2004, the activities of the MOH has included continual “distribution of the MPA manual, training of health staff of the remaining provinces, and distributing weighing scales at each Health Centre and referral hospital” according to the Annual Review of the National Nutrition Program in 2006.

1.4 Growth Monitoring in Kep

Kep Municipality is a region in the south of Cambodia with a population of 35,434 (4), and is composed of 5 communes of several villages each, for a total of 16 villages. There are currently one Operation District (OD) office, one regional hospital and 4 Health Centres (situated in three

locations with two of the health centers operating in the same building) with a total of eighteen health staff. The entire population of Kep lives in rural areas without electricity, clean water or sewage disposal. The training and implementation of MPA 10, that included growth monitoring and growth promotion activities, started in 2004. Five health care staff were trained in 2004 with funding from Health Sector Support Project of Ministry of Health (8). Hence, growth monitoring and growth promotion programs have been in the mandate of OD of Kep since 2004.

1.5 Research questions

This study aimed to evaluate the growth monitoring program in Kep. As was mentioned above, an effective and organized growth monitoring program can positively impact young children as well as their mothers. Monitoring children can lead to the detection of health and nutritional problems earlier when intervention is easier and more effective. Moreover, growth monitoring provides an opportunity for education of mothers about children's nutrition and growth. Hence, it is reasonable to expect that in Kep mothers of young children would know about growth monitoring and their children would have less malnutrition, indicated by weight-for-age, compared to Cambodian indices. Hence, the research questions were defined as the following:

1. What is the understanding and awareness of mothers of children under five about growth monitoring?
2. What is the effect on growth monitoring programs in Kep on the nutritional status of young children under five?

2. Methods

2.1 Participants + Recruitment

This research was carried out in the Kep Municipality, Cambodia, through the Kep field station of University of Toronto. Kep consists of 16 villages of varying sizes. To ensure regional representation, five large villages with comparable population sizes were selected from different geographical locations in Kep. The five villages chosen were: Damnak Chumbok, O Krasa, Chumka Bey, Ampeng, and Damnak Damnak Changoeur.

Key informants in this study were mothers of young children under five who are the targets of the Growth Monitoring Programs of the Ministry of Health. Twenty key informants were randomly approached from each village for a total of hundred subjects. According to Dr. Xu Xu Wei, the Medical Director of the Kep field station, operated by the University of Toronto's Center for International Health, the age range of mothers of young children is very broad in Cambodia, especially in Kep, ranging from teens to early 40's. To ensure that every age group is represented in the sample, mothers from different age groups were approached. Hence, two age categories of below and above thirty were chosen and equal numbers of mothers in each category were interviewed in each village. Participants were asked to take part by the investigator and a Khmer translator. The interviews took place after informed consent was obtained. Given that the children of the interviewee were measured to be plotted on growth charts, it was required for the participants to know the exact date of birth of their children. Thus, the participants in this study were:

1. mothers living in the Kep District
2. with at least one child 60 months of age or younger
3. who knew the exact birth-date of their children
4. and gave informed consent

2.2 Data Collection

To assess the knowledge, attitudes and practices of mothers in Kep regarding growth monitoring, semi-structured interviews were conducted, each ranging from 30-60 minutes. The purpose and the nature of the interview were explained through a translator, confidentiality issue were addressed, and an informed consent form was obtained from each participant. The interviews were guided by a pre-formed survey. The survey contains two parts. Part I was a demographic questionnaire. Part II was a set of questions regarding children's growth charts and growth monitoring. Since, "Weight-for-age is the most widely used indicator of child nutritional status in developing countries" (3), the youngest offspring of the interviewee (60 months or younger) was weighed at the end of the interview. The field research took place in June and July 2006. All interviews were conducted by the investigator and a Khmer translator.

2.2 Data Analysis

This study is both qualitative and quantitative. The data was analyzed in four steps. Initially all data were collected and transferred to Microsoft excel. Then the data were pooled and statistical analyses were performed. Following the statistical analysis, recurring trends were analyzed in the data. Finally the trend and findings were related back to the demographic data, as well as to the objectives of the study.

3. Results and Interpretations

3.1 Demographic

The five chosen villages were comparable in size.

Table 1. Villages chosen to sample

Village	Population	Family	Avg. Persons / family
Damnak Chambok	2994	599	4.99
O Krasa	3495	720	4.85
Chamka Bey	3098	589	5.25
Ampeng	3392	651	5.21
Damnak changoeur	3150	595	5.29

In every village, ten participants in each age category were randomly chosen and interviewed for a total of twenty participants per village. All the subjects were married. Although no income measures were taken, all families in the study engaged in fishing and agriculture and were comparable in their socioeconomic status. The subjects in this study were divided in to two categories based on age. The first group comprised of women under the age of 30 who had at least one child less than 60 months. The average age of this group was 24 years old (table 2). The second group consisted of women over age 30, who had at least one child below the age of 60 months. The average age of this group was 36.4 (table 3). The groups were comparable in their average number of children under 5 (1.4 for the first group and 1.5 for the second group). The mothers in older category had an average of 4.9 children in total while the younger mothers had a mean of 1.7 children. Hence, the two groups differed in their age and their total number

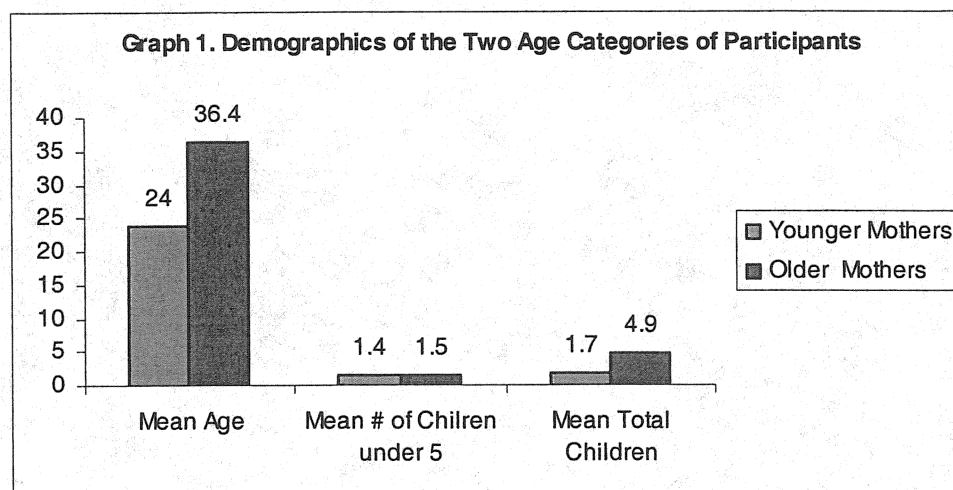
(Graph 1).

Table 2. Demographics of mothers in the “under 30” category

Village	# of Participants	Mean Age	Mean # of children ≤ 60 mon	Mean # of children
Damnak Chambok	10	25.4	1.2	1.5
O Krasa	10	23.8	1.6	1.7
Chamka Bey	10	24.7	1.5	2
Ampeng	10	23.8	1.3	1.6
Damnak changoeur	10	22.8	1.2	1.4
Total	50	24	1.4	1.7

Table 3. Demographics of mothers in the “over 30” category

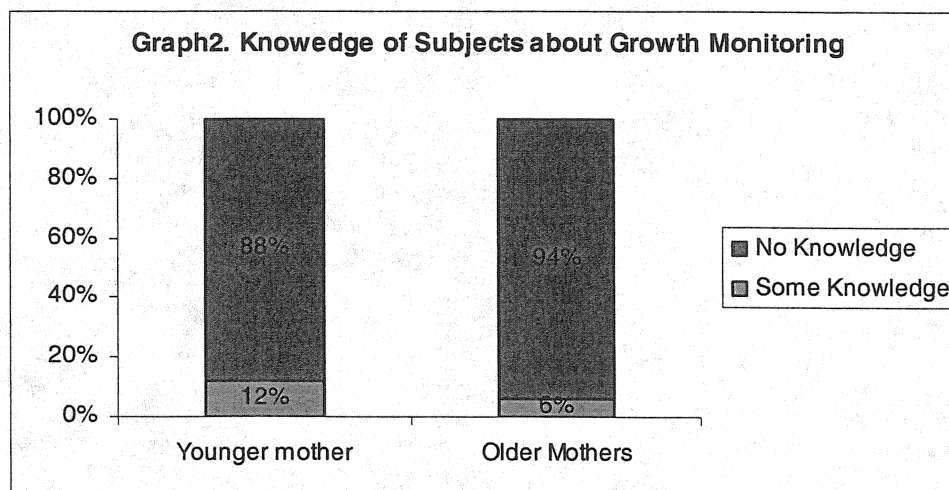
Village	# of Participants	Mean Age	Mean # of children ≤ 60 mon	Mean # of Children
Damnak Chambok	10	37.7	1.7	6.2
O Krasa	10	36.2	1.3	4.2
Chamka Bey	10	35.5	1.3	4.5
Ampeng	10	34.6	1.3	4.5
Damnak changoeur	10	37.4	1.7	5.1
Total	50	36.4	1.5	4.9



3.2 Knowledge about Growth Monitoring

Subjects were asked to present the Health Card (Yellow Card) of her youngest child since weight-for-age growth charts are published on reverse side of these cards. Each participant was asked about the growth charts to assess their knowledge about the purpose and importance of growth monitoring. The questions were followed by asking everyone whether a health staff, at any point, had ever explained these charts to them. If mothers were familiar with the growth charts, the source of the knowledge was sought. Although, almost all of the cards were recorded

on for immunization purposes, majority of the growth charts were blank and most mothers in the study did not know about the growth charts (Graph 2). Despite the low familiarity with the growth charts, the number of “older” mothers that knew about the charts was one half of the number of “younger” mothers that had an understanding about the growth monitoring.

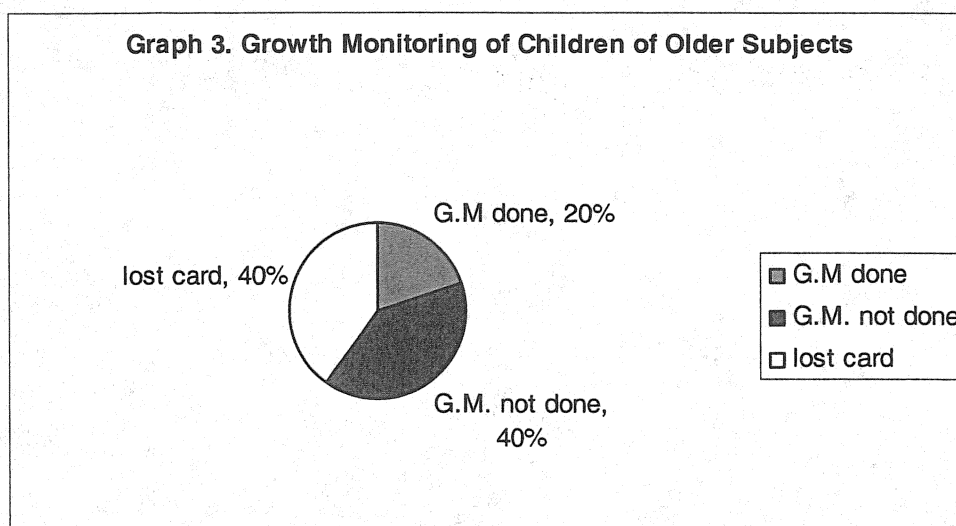


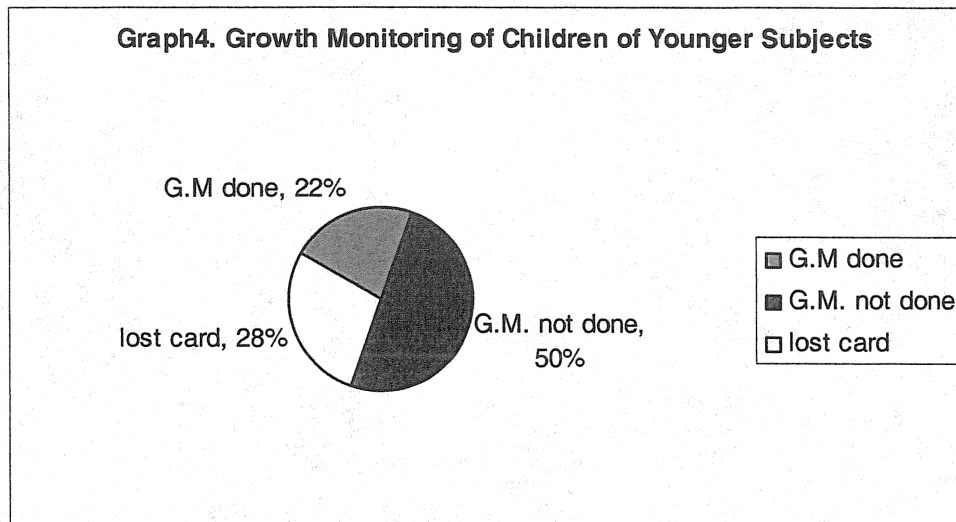
Less than 10% of the mothers in total claimed that a Health staff had ever explained the growth monitoring charts to them, indicating the inadequacy of health education taking place in Kep. Some of the participants -majority in the “over 30” category- that recalled being educated by the health staff were among the mothers who did not know about the growth charts. They claimed that they had not understood the explanation, most likely attributed to their low level of education. Meanwhile, some the participants- majority in the “under 30” category”- that had some knowledge about growth monitoring, had not been educated by a health care worker. They claimed that they had read the information on the yellow card about growth monitoring. This finding is consistent with the noted trend in this study that mothers under the age of 30 tended to be more educated compared to their older counterparts. Although this study was not large enough to assess such differences, it is reasonable to attribute the difference in the knowledge of younger and older mothers to their level of education, and not to a differential targeting of the outreach staff. Hence, knowledge about growth monitoring in Kep is limited. Although the reasons for this shortcoming is beyond the scope of this paper, insufficient health education by the outreach staff and low level of education of mothers are major contributing factors.

3.3 Growth Monitoring in Kep

Among the “under 30” age category, about 30% of mothers had lost their child’s card, while among the older mothers 40% of the cards were missing. The growth charts were evaluated to determine whether or not growth monitoring is adequately taking place in Kep. Adequate growth monitoring was defined initially as regular plotting of the child’s weight on the growth chart. Of the cards that were available to evaluate, none of the cards had been plotted adequately. Hence, as the research progressed, it became apparent that growth monitoring is not done appropriately in Kep. Therefore, the study definition for growth monitoring was changed and the children whose charts had at least one plot were accepted as having their growth monitored, albeit irregularly.

There were some differences in the proportions of children whose weight was plotted at least once in each village, although no trend can be elucidated. The two age categories were comparable in that in both groups about 20% of the charts were plotted at least once. Taking into account the number of mothers who did not have their cards, comparable proportion of the available card were blank, indicating a lack of growth monitoring activity. All in all, in Kep municipality among the five villages sampled, 31.8% of the children whose growth charts were evaluated were plotted at least once, while 68.2% of them had never had their growth monitored.

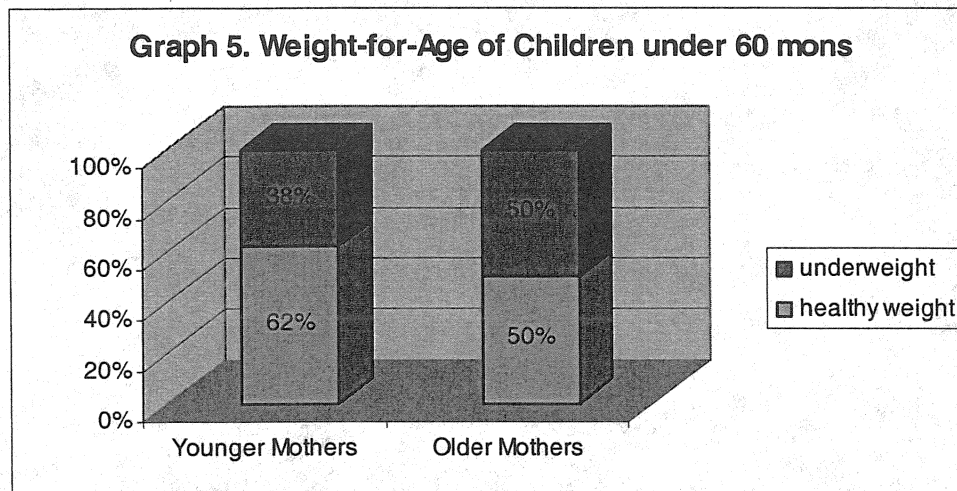




3.4 Nutritional Status

The youngest offspring of each participant was weighed. The only available Cambodian growth charts are weight-for-age charts that are printed on the back of the Child's Health cards. Given the ethnic differences in growth of children, Cambodian charts were used to plot the subjects in the study. These charts, however, are different from those used in Canada. Only one version is available for both genders. Also, these charts do not have percentile categorization of the weight-for-age. The points plotted fall in three categories on the Cambodian charts: healthy weight, mildly underweight and severely under weight. For the purpose of this study, the subjects were categorized to two groups of either healthy weight or low-for-age weight.

Comparing the two participant categories, 62% of children of younger mothers had a healthy weight for their age, while only 50% of the children of the mothers in the older category were healthy for their age on the weight chart. Alternatively, 38% of the children of the mothers in the younger category and 50% of the children in the second category were underweight (Graph 5). Pooling the data together, of the children sampled, 45% of children under the age of 60 months are underweight for their age in Kep municipality. This is an indication of a staggering level of malnutrition. Hence, as was expected, given that the growth monitoring program is unsatisfactory, little change has been affected in the high rate of malnutrition in children of Kep compared to previous studies.



4. Study Limitations

The study sampled only five out of the 16 villages. One limitation of this study was the incomplete sampling of the villages in the Kep municipality. Given that only large villages were sampled, differences between health care delivery to large and small villages, if any, were not detected. Three of the villages selected to participate in this study had a health centre. Although, the proximity of these health centres did not seem to make a difference in the growth monitoring activities in these villages compared to the two other villages in this study that did not have a health centre, such differential health care delivery to the farther villages cannot be ruled out. Furthermore, given the time and resource limitations, only twenty people were samples in each village for a total of a hundred subjects. Increasing the number of subjects would certainly increase the power of this study.

5. Conclusions

Growth monitoring activity in Kep was evaluated in the current study. About 90% of the mothers in the study did not know about growth charts. A combination of limited health education outreach and low education level of the mothers have contributed to the low level of understanding about the growth monitoring program in Kep. Among the children studied, none were adequately monitored. Hence, no downstream effects were assessed. Overall, in Kep municipality among the five villages sampled, less than one third of the children whose growth

charts were evaluated were plotted at least once, while over two thirds of them had never had their growth monitored. Hence, growth monitoring in Kep is done inconsistently in the five villages sampled. A more consistent implementation of the mandated growth monitoring program in Kep is required before its long term affects can be assessed.

6. Acknowledgement

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